Space Weather Forecast

Issued on Tuesday, 04 June 2024 at 12:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity with a slight chance of Strong flares. Glancing Coronal Mass Ejection (CME) impacts possible early in the period with a chance of Minor or Moderate Geomagnetic Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate during the last 24 hours, with four Moderate flare. The largest peaking at 03/0411 UTC from a sunspot region located in the northwest quadrant, with the other Moderate-class flares originating from the largest sunspot region near south-centre disc. There are currently ten numbered sunspot regions on the visible, with one small unnumbered region in the southeast. AR3697 near south-centre disc remains the most notable spot, the largest and most magnetically complex region. The two regions to its northeast have seen minor growth in recent hours. All remaining regions are either stable or continue to show only minor evolution. There are also currently a number of large and significant filaments of the solar disc, which will be monitored for any potential lift-off.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds at background levels initially, between 300-330km/s, but with a rising trend from around 03/2130 UTC to current slightly elevated levels at around 420-450 km/s. This was due to the glancing blow of a CME, which perhaps left the Sun on 31 May. The Interplanetary Magnetic Field, Bt, was weak initially, but increased to become Moderate to Strong, with a peak at 03/2145 UTC. The north-south component, Bz, also initially weak, became strongly positive (northward) with the CME arrival. Both indices easing back towards weak levels through the remainder of the period. Geomagnetic activity was mostly Quiet (1-2), with a Unsettled to Active interval at 03/2100-0000 UTC (Kp 3-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: High to Moderate activity is forecast with further Moderate class flare likely and a slight chance of isolated Strong class flares, these mainly from the complex sunspot in the southern disk.

Solar Wind / Geomagnetic Activity: Analysis of a CME associated with a flare on the 01 June from the complex sunspot region in the southern disc, suggests the potential for a glancing impact sometime later day 1 (04 Jun), or perhaps more likely early day 2 (05 Jun). Otherwise largely background solar winds are forecast to persist.

Geomagnetic activity is forecast to be mainly Quiet (Kp 2) initially, with a chance of Unsettled or Active intervals (Kp 3-4) due to the lingering impact of a glancing CME from 31 May. The risk of

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Unsettled or Active conditions increases late day 1 (04 Jun) or more likely into early day 2 (05 Jun), with a chance of G1-G2/Minor-Moderate (Kp5-6) Storm intervals associated with any CME arrival. Any CME influence is likely to gradually wane by day 3 (06 Jun). Becoming mostly Quiet by day 4 (07 Jun).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of rising above the S1 Minor Storm level in response to any further notable solar flares.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	50	5	1
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	5	5	5	5

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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